

**WE CLAIM**

1. A method of processing an image for printing, the method comprising the steps of:  
receiving image data in an image storage format;  
transforming the image data into print data at a rate of at least one billion pixels per second; and  
communicating the print data to a printhead.
2. A method as claimed in claim 1, which includes the step of transforming the image  
10 data into print data at a rate of at least ten billion pixels per second.
3. A method as claimed in claim 2, which includes the step of transforming the image  
data into print data at a rate of at least twenty billion pixels per second.
4. A method as claimed in claim 3, which includes the step of communicating the print  
data to the printhead at a rate of at least twenty billion pixels per second.
5. A method as claimed in claim 1, which includes the step of receiving the image data  
in a compressed format with the step of transforming the image data including the step of  
20 expanding the image data to produce output data representing decompressed page images.
6. A method as claimed in claim 5, which includes the step of expanding the image  
data to produce output data representing six color channels in a bi-level format.
7. A method as claimed in claim 1, in which the step of communicating the print data  
to a printhead includes the step of addressing a number of printhead chips of the printhead  
with the print data.
8. An image processing apparatus for a printer, the image processing apparatus  
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a data input means that is configured to receive image data in an image storage  
format;

a data processing means that is operatively connected to the data input means and is configured to process the image data at a rate of at least one billion pixels per second to transform the data into print data; and

a data communication means that is operatively connected to the data processing means and is configured to communicate the print data to a printhead.

9. An image processing apparatus as claimed in claim 8, which includes at least one print engine controller, the data input means, the data processing means, and the data communication means being at least partly defined by the print engine controller.

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10. An image processing apparatus as claimed in claim 9, which includes at least one memory storage device, the, or each, memory storage device being connected to one respective print engine controller to facilitate the temporary storage of the image and print data while the image and print data is processed and communicated to the printhead.

11. An image processing apparatus as claimed in claim 10, which includes at least one micro controller that is connected to one respective print engine controller via a micro controller interface to control operation of the print engine controller, the data input means including the micro controller interface.

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12. An image processing apparatus as claimed in claim 11, which includes a number of print engine controllers, a number of corresponding memory storage devices and a number of micro controllers, each print engine controller, each memory storage device and each micro controller being operatively connectable to a set of printhead chips, the printhead being defined by a number of the sets of printhead chips.

13. An image processing apparatus as claimed in claim 12, in which each print engine controller is in the form of an application specific integrated circuit (ASIC) that includes a data bus to facilitate communication between various components of the print engine controller.

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14. An image processing apparatus as claimed in claim 13, in which each print engine controller includes memory storage control circuitry and memory storage interface circuitry operatively connected between its associated memory storage device and the data bus, the memory storage interface circuitry being configured to provide an interface for read and write access to the memory storage device for the various components of the print engine controller and to provide arbitration between competing components for read and write access to the memory storage device, and the memory storage control circuitry being configured to provide the memory storage interface circuitry with access to the memory storage device.

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15. An image processing apparatus as claimed in claim 14, in which each print engine controller includes control circuitry and a control circuitry interface, the control circuitry being operatively connected between the data bus and the control circuitry interface, the control circuitry being configured to provide a means for reading and writing registers of the print engine controller and for reading and writing to the memory storage device in data blocks having a predetermined bit size and the control circuitry interface being configured to receive register reads to be written by the control circuitry.

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16. An image processing apparatus as claimed in claim 15, in which each print engine controller includes page expansion circuitry that is operatively connected to the data bus and is configured to read compressed image data and to write out decompressed image data

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17. An image processing apparatus as claimed in claim 16, in which each print engine controller includes line loading and line formatting circuitry and printhead interface circuitry, the line loading and line formatting circuitry being connected between the data bus and the printhead interface circuitry that is operatively connected to the associated printhead chips, the line loading and line formatting circuitry being configured to read the decompressed image data, to format the decompressed image data for the printhead chips and to write the formatted decompressed image data to the printhead interface and the printhead interface circuitry being configured for sending dot data to the printhead chips and for providing suitable synchronization between a number of the print engine controllers.

18. An inkjet printer that comprises  
a support structure;  
a platen positioned in the support structure;  
a print assembly positioned operatively with respect to the platen to define a  
printing zone between the platen and the print assembly, the print assembly comprising  
an elongate carrier; and  
a number of printhead chips positioned on the carrier, the printhead chips  
together defining a printhead;  
10 an image processing apparatus that is operatively arranged with respect to the print  
assembly, the image processing apparatus comprising  
a data input means configured to receive image data in an image storage  
format;  
a data processing means that is configured to process the image data at a rate  
of at least one billion pixels per second to transform the data into print data; and  
a data communication means that is configured to communicate the print  
data to the printhead; and  
a feed mechanism positioned on the support structure for feeding a print medium  
through the printing zone.